

**What is claimed is:**

1. A digital broadcast system allowing a transmitter to broadcast a set of linked content elements, a receiver to select a content element from a set of transmitted content elements for output, and a viewer to switch to a content element selected in response to an operation input by the viewer;  
said digital broadcast system comprising a transmitter and a receiver,  
said transmitter transmitting said sets of content elements repeatedly with a plurality of content elements as one set, and transmitting repeatedly one or more navigation control data for controlling to determine which of a plurality of content elements to output, and  
said receiver comprising  
a receiving portion for receiving transmitted data,  
an operation receiving portion for receiving an operator operation, and  
a restoring portion for determining which content element to restore next based on the operation received by the operation receiving portion and in accordance with the navigation control data, for selecting a content element to be restored next out of content elements transmitted repeatedly, and for restoring the element for output, in a receiving mode; for restoring and recording a set of navigation control data and a set of content elements, in a recording mode; and for selecting a content element from a set of recorded content elements for output, based on the operation received by the operation receiving portion and in accordance with the recorded navigation control data, in a reproducing mode.
2. The digital broadcast system according to Claim 1, wherein  
said transmitter transmits sets of content elements as elementary streams to which a series of sequential information are attached, and transmits repeatedly fetch control data which fetches each of the content elements from said elementary streams in accordance with said series of information with the fetch control data associated with the content elements; and  
the restoring portion of said receiver fetches a target content element

from the elementary streams in accordance with the series of information of said fetch control data in the receiving mode and recording mode.

3. The digital broadcast system according to Claim 2, wherein  
time information is utilized as said series of information, and  
said content elements are dynamic video image data or audio data which  
are sliced in said elementary streams in accordance with a start time and  
termination time of said time information.

4. The digital broadcast system according to Claim 2, wherein  
time information is utilized as said series of information, and  
said content elements are still video image data which are sliced in said  
elementary streams in accordance with said time information.

5. The digital broadcast system according to Claim 1, wherein  
said transmitter associates a content element list which shows a list of  
content elements included in the sets of content elements with the sets of  
content elements and transmits the content element list, and  
said restoring portion of said receiver determines whether or not all  
content elements included in the sets of content elements have been recorded,  
in accordance with said content element list in the recording mode.

6. The digital broadcast system according to Claim 1, wherein  
said transmitter associates a navigation list which shows a list of  
navigation control data included in the sets of navigation control data with the  
sets of navigation control data and transmits the navigation list, and  
said restoring portion of said receiver determines whether or not all  
navigation control data included in the sets of the navigation data have been  
recorded, in accordance with said navigation list in the recording mode.

7. The digital broadcast system according to Claim 1, wherein

said transmitter attaches an expiration date to a set of content elements or a set of fetch control data for transmission thereof, and

the restoring portion of said receiver associates said expiration date with a set of content elements for recording thereof in the recording mode, and does not output said set of content elements if said expiration date has expired or outputs the same together with information that said expiration date has expired, in the reproducing mode.

8. The digital broadcast system according to Claim 1, wherein

said transmitter attaches an expiration date to content elements or fetch control data for transmission thereof, and

the restoring portion of said receiver associates said expiration date with content elements for recording thereof in the recording mode, and does not output said content elements if said expiration date has expired or outputs the same together with information that said expiration date has expired, in the reproducing mode.

9. The digital broadcast system according to Claim 7, wherein

said expiration date is included in a content element list or a navigation list for transmission thereof.

10. A digital broadcast receiver which allows a viewer to switch to content elements selected in response to an operation input by the viewer,

said digital broadcast receiver comprising

a receiving portion for receiving transmitted data,

an operation receiving portion for receiving an operator operation, and

a restoring portion for determining which content element to restore next

based on the operation received by the operation receiving portion and in accordance with the navigation control data, for selecting a content element to

be restored next out of content elements transmitted repeatedly, and for restoring the element for output, in a receiving mode; for restoring and recording a set of

navigation control data and a set of content elements, in a recording mode; and for selecting a content element from a set of content elements for output, based on the operation received by the operation receiving portion and in accordance with the recorded navigation control data, in a reproducing mode.

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11. The digital broadcast receiver according to Claim 10, wherein  
said restoring portion fetches a target content element from elementary  
streams in accordance with fetch control data for identifying content elements  
with a series of sequential information attached thereto in accordance with said  
10 series of information, in the receiving mode and recording mode.

12. The digital broadcast receiver according to Claim 11, wherein  
time information is utilized as said series of information, and  
said content elements are dynamic video image data or audio data which  
15 are sliced in said elementary streams in accordance with a start time and  
termination time of said time information.

13. The digital broadcast receiver according to Claim 11, wherein  
time information is utilized as said series of information, and  
20 said content elements are still video image data which are sliced in said  
elementary streams in accordance with said time information.

14. The digital broadcast receiver according to Claim 10, wherein  
said restoring portion determines whether or not all content elements  
25 included in the sets of content elements have been recorded, in accordance with  
a received content element list in the recording mode.

15. The digital broadcast receiver according to Claim 10, wherein  
said restoring portion determines whether or not all navigation control  
30 data included in sets of navigation data have been recorded, in accordance with  
a received navigation list in the recording mode.

16. The digital broadcast receiver according to Claim 10, wherein  
said restoring portion fetches all target fetch control data without  
specifying which fetch control data to fetch, and records content elements in  
sequence in the order of obtaining fetch control data, in the recording mode.

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17. The digital broadcast receiver according to Claim 10, wherein  
said restoring portion fetches all target navigation control data without  
specifying which navigation control data to fetch, and records navigation control  
data in sequence in the order of obtaining navigation control data, in the  
10 recording mode.

18. The digital broadcast receiver according to Claim 10, wherein  
said restoring portion in the recording mode fetches all target fetch  
control data without specifying which fetch control data to fetch, and records  
15 content elements in sequence in the order of obtaining fetch control data while  
a number of unrecorded fetch control data remains, and  
when a small number of unrecorded fetch control data remains, specifies  
said unrecorded fetch control data in order to be fetched and recorded.

19. The digital broadcast receiver according to Claim 10, wherein  
said restoring portion in the recording mode fetches all target navigation  
control data without specifying which navigation control data to fetch, and  
records content elements in sequence in the order of obtaining navigation control  
data while a number of unrecorded navigation control data remains, and  
20 when a small number of unrecorded navigation control data remains,  
specifies said unrecorded navigation control data in order to be fetched and  
25 recorded.

20. The digital broadcast receiver according to Claim 10, wherein  
30 said restoring portion associates an expiration date transmitted  
corresponding to a set of content elements or a set of fetch control data with the

set of content elements for recording thereof in the recording mode; and does not output said set of content elements if said expiration date has expired or outputs the same together with information that said expiration date has expired, in the reproducing mode.

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21. The digital broadcast receiver according to Claim 10, wherein  
said restoring portion associates an expiration date transmitted  
corresponding to content elements or fetch control data with said content  
elements for recording thereof in the recording mode; and does not output said  
10 content elements if said expiration date has expired or outputs the same together  
with information that said expiration date has expired, in the reproducing mode.

22. A digital broadcast recorder for recording digital broadcast which allows  
a viewer to switch to content elements selected in response to an operation input  
15 by the viewer,  
said digital broadcast recorder comprising  
a receiving portion for receiving transmitted data, and  
a recording portion which fetches a target content element from  
elementary streams in accordance with fetch control data for identifying content  
20 elements with a series of sequential information attached thereto in accordance  
with said series of information, and which restores a set of content elements for  
recording thereof and as well records a set of navigation control data.

23. A digital broadcast receiver comprising  
25 a receiving portion for receiving transport streams,  
an operation receiving portion for receiving an operator operation,  
a transport decoder for selecting at least desired navigation control data  
and content elements from received transport streams in accordance with the  
operator operation for output,  
30 an extending decoder for extending output from the transport decoder,  
a CPU for controlling each aforementioned portion,

a memory which records a program for determining control contents of said CPU, and

a recording portion for recording;

said digital broadcast receiver wherein

5        said program allows the CPU to perform processing for determining content elements to be restored next based on the operation received by the operation receiving portion in accordance with the navigation control data, separating the content elements to be restored next out of sets of content elements transmitted repeatedly by means of the transport decoder, and restoring  
10       the same for output by extending the same by means of the extending decoder, in the receiving mode; restores a set of navigation control data and a set of content elements for recording the same in the recording portion in a recording mode; and selecting a content element out of a recorded set of content elements in the reproducing mode, based on the operation received by the operation  
15       receiving portion in accordance with the navigation control data recorded in the recording portion.

24.       A recording medium which records a program for allowing a CPU to perform reception processing; the CPU controlling a receiving portion for  
20       receiving transport streams, an operation receiving portion for receiving an operator operation, a transport decoder for selecting at least desired navigation control data and content elements from received transport streams in accordance with the operator operation for output, an extending decoder for extending output from the transport decoder, and a recording portion for  
25       recording;

      said recording medium for recording a program which allows the CPU to perform processing for determining content elements to be restored next based on the operation received by the operation receiving portion in accordance with the navigation control data, separating the content elements to be restored next  
30       out of sets of content elements transmitted repeatedly by means of the transport decoder, and restoring the same for output by extending the same by means of

the extending decoder, in the receiving mode; restoring a set of navigation control data and a set of content elements for recording the same in the recording portion in a recording mode; and selecting a content element out of a recorded set of content elements in the reproducing mode, based on the operation  
5 received by the operation receiving portion in accordance with the navigation control data recorded in the recording portion.

25. A digital broadcast transmitter which transmits a set of linked content elements,

10 said digital broadcast transmitter

transmitting said sets of content elements repeatedly with a plurality of content elements as one set, and transmitting repeatedly one or more navigation control data for controlling to determine which one of a plurality of content elements to output, and

15 associating a content element list showing a list of content elements included in sets of content elements with sets of content elements for transmission thereof.

26. A digital broadcast method which allows a set of linked content elements  
20 to be broadcast from a transmitting side and which allows a content element at a receiving side to be selected out of transmitted set of content elements for output and a viewer to switch to content elements selected in response to the viewer operation input,

said digital broadcast method comprising the steps of:

25 transmitting said set of content elements repeatedly with a plurality of content elements as one set, and

transmitting repeatedly one or more navigation control data for controlling to determine which one of a plurality of content elements to transmit, at said transmitting side; and, at said receiving side,

30 receiving transmitted data,

determining which content element to restore next based on the



operation of the viewer and in accordance with the navigation control data,  
selecting a content element to be restored next out of content elements  
transmitted repeatedly,

restoring the element for output, in a receiving mode;

5 restoring and recording a set of navigation control data and a set of  
content elements, in a recording mode; and

selecting a content element from a set of recorded content elements for  
output, based on the operation received by the operation receiving portion and  
in accordance with the recorded navigation control data, in a reproducing mode.

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27. A digital broadcast system allowing a transmitter to broadcast a set of  
content elements linked to one another by descriptions of the content elements  
themselves, a receiver to select a content element from a set of transmitted  
content elements for output, and a viewer to switch to a content element  
15 selected in response to an operation input by the viewer;

said digital broadcast system comprising a transmitter and a receiver,

said transmitter transmitting said sets of content elements repeatedly with  
a plurality of content elements as one set, and

said receiver comprising

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a receiving portion for receiving transmitted data,

an operation receiving portion for receiving an operator operation, and

a restoring portion for determining which content element to restore next

based on the operation received by the operation receiving portion and in  
accordance with link information in the content elements, for selecting a content

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element to be restored next out of content elements transmitted repeatedly, and

for restoring the element for output, in a receiving mode; for restoring and  
recording a set of content elements, in a recording mode; and for selecting a

content element from a set of recorded content elements for output, based on the  
operation received by the operation receiving portion and in accordance with link

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information in the content elements, in a reproducing mode.

28. A digital broadcast receiver which allows a viewer to switch to content elements selected in response to an operation input by the viewer,  
said digital broadcast receiver comprising  
a receiving portion for receiving transmitted data,  
an operation receiving portion for receiving an operator operation, and  
a restoring portion for determining which content element to restore next  
based on the operation received by the operation receiving portion and in  
accordance with link information in the content elements, for selecting a content  
element to be restored next out of content elements transmitted repeatedly, and  
for restoring the element for output, in a receiving mode; for restoring and  
recording a set of content elements, in a recording mode; and for selecting a  
content element from a set of recorded content elements for output, based on the  
operation received by the operation receiving portion and in accordance with link  
information in the content elements, in a reproducing mode.

29. A digital broadcast system allowing a transmitter to broadcast a set of  
linked content elements, a receiver to select a content element from a set of  
transmitted content elements for output, and a viewer to switch to a content  
element selected in response to an operation input by the viewer;

said digital broadcast system comprising a transmitter and a receiver,  
said transmitter transmitting said sets of content elements repeatedly with  
a plurality of content elements as one set, and transmitting repeatedly one or  
more navigation control data for controlling to determine which of a plurality of  
content elements to output, and

said receiver comprising  
a receiving portion for receiving transmitted data,  
an operation receiving portion for receiving an operator operation, and  
a restoring portion for determining which content element to restore next  
based on the operation received by the operation receiving portion and in  
accordance with the navigation control data, for selecting a content element to  
be restored next out of content elements transmitted repeatedly, and for restoring

the element for output; wherein

said restoring portion performs processing of restoring and recording other content elements in parallel with the processing of selecting and restoring a desired content element determined based on the operation input by the operator, and outputs content elements which have been restored in advance and recorded, in the case where content elements determined based on the operation input by the operator have already been recorded.

30. The digital broadcast system according to Claim 29, wherein

said transmitter transmits sets of content elements as elementary streams to which a series of sequential information is attached, and transmits repeatedly fetch control data which fetches each of the content elements from said elementary streams in accordance with said series of information with the fetch control data associated with the content elements; and

the restoring portion of said receiver fetches a target content element from the elementary streams in accordance with the series of information of said fetch control data.

31. The digital broadcast system according to Claim 29, wherein

time information is utilized as said series of information, and said content elements are dynamic video image data or audio data which are sliced in said elementary streams in accordance with a start time and termination time of said time information.

32. The digital broadcast system according to Claim 29, wherein

time information is utilized as said series of information, and said content elements are still video image data which are sliced in said elementary streams in accordance with said time information.

33. The digital broadcast system according to Claim 29, wherein

said transmitter associates a content element list which shows a list of

content elements included in the sets of content elements with the sets of content elements and transmits the content element list, and

said restoring portion of said receiver determines whether or not all content elements included in the sets of content elements have been recorded,  
5 in accordance with said content element list.

34. The digital broadcast system according to Claim 29, wherein  
said transmitter associates a navigation list which shows a list of navigation control data included in the sets of navigation control data with the  
10 sets of navigation control data and transmits the navigation list, and

said restoring portion of said receiver determines whether or not all navigation control data included in the sets of the navigation data have been recorded, in accordance with said navigation list.

35. The digital broadcast system according to Claim 29, wherein  
said transmitter attaches an associated expiration date or a version to a whole set of content elements or an individual content element for transmission thereof, and

the restoring portion of said receiver associates said expiration date or  
20 version with a whole set of content elements or an individual content element for recording, and performs optimization processing in accordance with said expiration date or version.

36. The digital broadcast system according to Claim 35, wherein  
25 the optimization processing performed by the restoring portion of said receiver causes, in the case where desired content elements determined in accordance with the operator operation have already been written, the recorded content elements not to be outputted or to be outputted together with the information that the expiration date has expired, when the expiration date of said  
30 content elements has expired or if the version is not up to date.

37. The digital broadcast system according to Claim 35, wherein  
the optimization processing performed by the restoring portion of said  
receiver causes, in the case where desired content elements determined in  
accordance with the operator operation have already been written, the recorded  
5 content elements not to be outputted, and allows for selecting a desired content  
element from a transmitted set of content elements to restore and output the  
same, when the expiration date of said content elements has expired or if the  
version is not up to date.

10 38. The digital broadcast system according to Claim 35, wherein  
the optimization processing performed by the restoring portion of said  
receiver performs comparison between a version transmitted associated with  
content elements and a version already recorded or comparison between current  
date and time and expiration date already recorded, and, if the expiration date  
15 has expired or the version is not up to date, then allows again for restoring  
transmitted content elements for recording thereof.

39. The digital broadcast system according to Claim 35, wherein  
said transmitter transmits information regarding to whether or not a new  
20 set of content elements or content elements having a subsequent version or  
subsequent expiration date is to be transmitted, associated with a whole set of  
content elements or individual content elements.

40. A digital broadcast receiver which allows a viewer to switch to content  
25 elements selected in response to an operation input by the viewer,  
said digital broadcast receiver comprising  
a receiving portion for receiving transmitted data,  
an operation receiving portion for receiving an operator operation, and  
a restoring portion for determining which content element to restore next  
30 based on the operation received by the operation receiving portion and in  
accordance with the navigation control data, for selecting a content element to

be restored next out of content elements transmitted repeatedly, and for restoring the element for output; wherein

said restoring portion performs processing of restoring and recording other content elements in parallel with the processing of selecting and restoring a desired content element determined based on the operation input by the operator, and outputs content elements which have been restored in advance and recorded, in the case where content elements determined based on the operation input by the operator have already been recorded.

41. The digital broadcast system according to Claim 39, wherein said restoring portion fetches a target content element from elementary streams in accordance with fetch control data for identifying content elements with a series of sequential information attached thereto in accordance with said series of information, in the receiving mode and recording mode.

42. The digital broadcast system according to Claim 41, wherein time information is utilized as said series of information, and said content elements are dynamic video image data or audio data which are sliced in said elementary streams in accordance with a start time and termination time of said time information.

43. The digital broadcast receiver according to Claim 41, wherein time information is utilized as said series of information, and said content elements are still video image data which are sliced in said elementary streams in accordance with said time information.

44. The digital broadcast system according to Claim 40, wherein said restoring portion determines whether or not all content elements included in the sets of content elements have been recorded, in accordance with a received content element list.

45. The digital broadcast receiver according to Claim 40, wherein  
said restoring portion determines whether or not all navigation control  
data included in sets of navigation data have been recorded, in accordance with  
a received navigation list.

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46. The digital broadcast receiver according to Claim 40, wherein  
said restoring portion fetches all target fetch control data without  
specifying which fetch control data to fetch, and records content elements in  
sequence in the order of obtaining fetch control data.

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47. The digital broadcast receiver according to Claim 40, wherein  
said restoring portion fetches all target navigation control data without  
specifying which navigation control data to fetch, and records navigation control  
data in sequence in the order of obtaining navigation control data.

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48. The digital broadcast receiver according to Claim 40, wherein  
said restoring portion fetches all target fetch control data without  
specifying which fetch control data to fetch, and records content elements in  
sequence in the order of obtaining fetch control data while a number of  
unrecorded fetch control data remains, and

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when a small number of unrecorded fetch control data remains, specifies  
said unrecorded fetch control data in order to be fetched and recorded.

49. The digital broadcast receiver according to Claim 40, wherein  
said restoring portion fetches all target navigation control data without  
specifying which navigation control data to fetch, and records content elements  
in sequence in the order of obtaining navigation control data while a number of  
unrecorded navigation control data remains, and

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when a small number of unrecorded navigation control data remains,  
specifies said unrecorded navigation control data in order to be fetched and  
recorded.

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50. The digital broadcast receiver according to Claim 40, wherein  
said restoring portion associates said expiration date or version, which is  
transmitted associated with a whole set of content elements or an individual  
content element, with a whole set of content elements or an individual content  
5 element for recording, and performs optimization processing in accordance with  
said expiration date or version.

51. The digital broadcast system according to Claim 50, wherein  
the optimization processing performed by said restoring portion causes,  
10 in the case where desired content elements determined in accordance with the  
operator operation have already been written, the recorded content elements not  
to be outputted or to be outputted together with the information that the  
expiration date has expired, when the expiration date of said content elements  
has expired or if the version is not up to date.

52. The digital broadcast system according to Claim 50, wherein  
the optimization processing performed by the restoring portion of said  
receiver causes, in the case where desired content elements determined in  
accordance with the operator operation have already been written, the recorded  
20 content elements not to be outputted, and allows for selecting a desired content  
element from a transmitted set of content elements to restore and output the  
same, when the expiration date of said content elements has expired or if the  
version is not up to date.

53. The digital broadcast system according to Claim 48, wherein  
the optimization processing performed by said restoring portion performs  
a comparison between a version transmitted associated with content elements  
and a version already recorded or a comparison between current date and time  
and expiration date already recorded, and, if the expiration date has expired or  
30 the version is not up to date, then allows again for restoring transmitted content  
elements for recording thereof.



54. The digital broadcast system according to Claim 48, wherein  
said restoring portion receives information regarding whether or not a  
new set of content elements or content elements having a subsequent version or  
5 subsequent expiration date is to be transmitted, and determines whether or not  
a new set of content elements is or content elements are restored, in accordance  
with said information.

55. A digital broadcast receiver comprising  
10 a receiving portion for receiving transport streams,  
an operation receiving portion for receiving an operator operation,  
a transport decoder for selecting at least desired navigation control data  
and content elements from received transport streams in accordance with the  
operator operation for output,

15 an extending decoder for extending output from the transport decoder,  
a CPU for controlling each aforementioned portion,  
a memory which records a program for determining control contents of  
said CPU, and

20 a recording portion for recording;  
said digital broadcast receiver wherein  
said program allows the CPU to perform  
processing for determining content elements to be restored next based  
on the operation received by the operation receiving portion in accordance with  
the navigation control data, separating the content elements to be restored next  
25 out of sets of content elements transmitted repeatedly by means of the transport  
decoder, and restoring and outputting the same by extending the same by means  
of the extending decoder;

processing, carried out in parallel to said processing, for restoring content  
elements other than contents to be restored next and recording the same in the  
30 recording portion; and

processing for outputting content elements which have been restored in

advance and recorded, in the case where content elements determined based on the operation input by the operator have already been recorded.

56. A recording medium which records a program for allowing a CPU to perform reception processing; the CPU controlling a receiving portion for receiving transport streams, an operation receiving portion for receiving an operator operation, a transport decoder for selecting at least desired navigation control data and content elements from received transport streams in accordance with the operator operation for output, an extending decoder for extending output from the transport decoder, and a recording portion for recording;

said recording medium for recording a program which allows the CPU to perform

processing for determining content elements to be restored next based on the operation received by the operation receiving portion in accordance with the navigation control data, separating the content elements to be restored next out of sets of content elements transmitted repeatedly by means of the transport decoder, and restoring and outputting the same by extending the same by means of the extending decoder;

processing, carried out in parallel to said processing, for restoring content elements other than contents to be restored next and recording the same in the recording portion; and

processing for outputting content elements which have been restored in advance and recorded, in the case where content elements determined based on the operation input by the operator have already been recorded.

57. A digital broadcast transmitter which transmits a set of linked content elements,

said digital broadcast transmitter

transmitting said sets of content elements repeatedly with a plurality of content elements as one set, and transmitting repeatedly one or more navigation

control data for controlling to determine which one of a plurality of content elements to output, and

transmitting a whole set of content elements or individual content elements, associated with an expiration date or version.

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58. A digital broadcast method which allows a set of linked content elements to be broadcast from a transmitting side and which allows a content element at a receiving side to be selected out of a transmitted set of content elements for output and a viewer to switch to content elements selected in response to the viewer operation input,

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said digital broadcast method comprising the steps of:

transmitting said set of content elements repeatedly with a plurality of content elements as one set, and

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transmitting repeatedly one or more navigation control data for controlling to determine which one of a plurality of content elements to transmit, at said transmitting side;

receiving transmitted data,

determining which content element to restore next based on the operation of the viewer and in accordance with the navigation control data,

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selecting a content element to be restored next out of content elements transmitted repeatedly,

restoring and outputting the element; as well as

performing processing of restoring and recording other content elements in parallel with processing of selecting and restoring a desired content element determined based on the operation input by the operator, and

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outputting content elements which have been restored in advance and recorded, in the case where content elements determined based on the operation input by the operator have already been recorded.

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59. A digital broadcast system allowing a transmitter to broadcast a set of content elements linked to one another by descriptions of the content elements

themselves, a receiver to select a content element from a set of transmitted content elements for output, and a viewer to switch to a content element selected in response to an operation input by the viewer;

5       said digital broadcast system comprising a transmitter and a receiver,  
      said transmitter transmitting said sets of content elements repeatedly with  
      a plurality of content elements as one set, and  
      said receiver comprising  
      a receiving portion for receiving transmitted data,  
      an operation receiving portion for receiving an operator operation, and  
10       a restoring portion for determining which content element to restore next  
      based on the operation received by the operation receiving portion and in  
      accordance with link information in the content elements, for selecting a content  
      element to be restored next out of content elements transmitted repeatedly, and  
      for restoring the element for output; wherein  
15       said restoring portion performs processing of restoring and recording  
      other content elements in parallel with processing of selecting and restoring a  
      desired content element determined based on the operation input by the  
      operator, and outputs content elements which have been restored in advance  
      and recorded, in the case where content elements determined based on the  
20       operation input by the operator have already been recorded.

60.     A digital broadcast receiver which allows a viewer to switch to content  
      elements selected in response to an operation input by the viewer,  
      said digital broadcast receiver comprising  
25       a receiving portion for receiving transmitted data,  
      an operation receiving portion for receiving an operator operation, and  
      a restoring portion for determining which content element to restore next  
      based on the operation received by the operation receiving portion and in  
      accordance with link information in the content elements, for selecting a content  
30       element to be restored next out of content elements transmitted repeatedly, and  
      for restoring the element for output, in a receiving mode; wherein

said restoring portion performs processing of restoring and recording other content elements in parallel with processing of selecting and restoring a desired content element determined based on the operation input by the operator, and outputs content elements which have been restored in advance and recorded, in the case where content elements determined based on the operation input by the operator have already been recorded.

61. The digital broadcast system according to Claim 29, wherein said transmitter transmits recording process information that is basis for judging whether the recording process is carried out or not at the receiver, associated with a whole set of content elements, individual content elements, a whole set of navigation control data or individual navigation control data.

62. The digital broadcast system according to Claim 61, wherein said transmitter transmits recording necessity information that show whether the recording process is necessary or not.

63. The digital broadcast system according to Claim 61, wherein said transmitter transmits frequency information of revising version.

64. The digital broadcast receiver according to Claim 40, wherein said restoring portion judging whether the content element or the navigation control data should be recorded or not, in the basis of recording process information sent from the transmitter.

65. The digital broadcast receiver according to Claim 64, wherein said restoring portion judging whether the content element or the navigation control data should be recorded or not, in the basis of recording necessity information sent from the transmitter.

66. The digital broadcast receiver according to Claim 65, wherein

said restoring portion judging whether the content element or the navigation control data should be recorded or not, in the basis of frequency information of revising version sent from the transmitter.

- 5 67. A digital broadcast transmitter which transmits a set of linked content elements,

said digital broadcast transmitter

- transmitting said sets of content elements repeatedly with a plurality of content elements as one set, and transmitting repeatedly one or more navigation  
10 control data for controlling to determine which one of a plurality of content elements to output, and

associating recording process information with sets of content elements or individual content element for transmission thereof.

- 15 68. A carrier wave carrying a set of linked content elements,

said carrier wave transmitting said sets of content elements repeatedly with a plurality of content elements as one set, and transmitting repeatedly one or more navigation control data for controlling to determine which of a plurality of content elements to output; and

- 20 associating a content element list which shows a list of content elements included in the sets of content elements with the sets of content elements and transmitting the content element list.

69. A carrier wave carrying a set of linked content elements,

- 25 said carrier wave transmitting said sets of content elements repeatedly with a plurality of content elements as one set, and transmitting repeatedly one or more navigation control data for controlling to determine which of a plurality of content elements to output; and

- transmitting a whole set of content elements or individual content  
30 elements, associated with an expiration date or version.